Jerome Johnson

STATE OF MISSOURI
Mel Carnahan, Governor • Stephen M. Mahfood, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

September 19, 2000

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RETURN RECEIPT REQUESTED

Mr. Joseph Haake
Group Manager
The Boeing Company
Dept. 464C, Bldg. 220
Mail Code S221-1400
P.O. Box 516
St. Louis, MO 63166-0516

RE: The Boeing Company
Phase 2 Environmental Site Assessment Report and Workplan Addendum

Dear Mr. Haake:

The Missouri Department of Natural Resources' (DNR) Hazardous Waste Program (HWP) in conjunction with the Department of Geology and Land Survey (DGLS) has completed review of the Phase 2 Environmental Site Assessment Report dated September 1, 2000 and the Workplan Addendum dated September 7, 2000. The DNR and DGLS have several comments that must be addressed by Boeing before final approval of the Workplan.

General Comments

1. The Workplan named above does not bear the seal of a geologist who is registered in the state of Missouri. This document incorporates or is based on a geologic study or on geologic data that had a bearing on conclusions or recommendations reached after January 1, 1997. The Missouri Board of Geologist Registration is charged with the enforcement of the Missouri Geologist Registration Law that includes the requirement that geologic work where public health, safety or welfare are at risk or potentially at risk be completed by or under the direct supervision of a geologist registered in Missouri. The following review comments and/or recommendations convey no endorsement as to the validity of the work being completed in accordance with the Missouri Geologist Registration Law or the Board of Geologist Registration. Further, the review comments and/or

recommendations cannot be accepted as being fully completed until the reviewed document is properly sealed/stamped by a geologist registered in Missouri in accordance with the law and the rules as administered by the board.

2. Metals have been detected in high concentrations throughout the site. These samples were not filtered before testing. There is evidence supporting the notion that many of these metals are associated with the soil and not the groundwater. For example, in the southern portion of the site, high levels of metals were detected in groundwater samples at borings B22W1, B22E3, and B22E2, yet water from MW7, located in the same area, showed much lower levels. Because of this inconsistency DNR and DGLS recommend that all subsequent metals testing includes both filtered and unfiltered samples. This is not to imply that there is not a problem with metals contamination at this site, but instead to determine if the contamination is a groundwater or a soil concern.

3. DNR and DGLS understands Boeing's desire to establish "clean" groundwater monitoring points that will delineate the extent of downgradient impacts. These monitoring wells should be installed not only adjacent to the clean borings, but should also be centrally located downgradient of the contaminant plume. It is unclear in the workplan if this is the intended location.

4. Registration forms for the temporary piezometers and groundwater monitoring wells installed during Phase 2A have not been received by the Wellhead Protection Section, DGLS. The Geological Survey Program (GSP) would like to remind Boeing and their contractor that the time frame for submitting the registration forms is drawing near.

5. The DNR and GSP would like to be present during the drilling and installation of the deep groundwater monitoring wells. In order to arrange staff schedules, it would be most helpful if notice could be provided as far in advance as possible.

6. Construction diagrams should be included for all monitoring wells and temporary piezometers.

Specific Comments

1. Section 3.2.1.1 Investigation of Downgradient Locations.

   East of Bldg. 27

   The workplan states that borings for VOC's and metals will be conducted independently, with separate monitoring well nests for each type of contamination. Because the contamination is in the same general area, DNR and GSP believe it may be possible to combine this investigation, sampling for both VOC's and metals in the exploratory borings and use one nest of monitoring wells (shallow and deep) to delineate the downgradient impacts.

2. Section 3.2.1.2 Investigation of Recycling Area and Hazardous Waste Area

   It is unclear in the workplan whether or not metals will be included in the analysis of the borings conducted in the recycle area. Elevated levels of Cadmium, Arsenic and Chromium have been identified in this area. Metal analysis should be included in this area.

   Because of the elevated levels of TCE and daughter products identified in the recycle area and by Bldg. 28 (Boring B28N1) an investigation of possible deeper impact should be conducted in these areas. If the clay layer above the lower aquifer unit shows signs of contamination, a deep monitoring well or temporary piezometer should be installed to determine the impact on the deeper unit in both these areas. The elevated levels of 1,2-DCE and vinyl chloride in these areas indicates the contamination is oldest here leading to possibilities of deeper impacts.

   Diesel Petroleum Hydrocarbons have been detected at the RC2 boring. Because of the high groundwater concentration (34 ppm) and soil concentration (980 ppm) it will be necessary to determine the horizontal extent of the contamination. TPH testing should be included in the additional recycle center borings.

   The use of a Dual Tube sampler lessens the concern of penetrating the silt aquitard unit. The GSP has reviewed the boring logs and Phase 2 Environmental Site Assessment Report and understands the basis for identifying the silt unit as an aquitard. The GSP would like to know if ESE has conducted laboratory hydraulic conductivity testing of this unit. If they have not, such testing or in-situ testing should be considered during the Phase 2B investigation.

3. Section 3.2.2 Supplemental Groundwater Evaluation at Bldg. 220

   Evaluation of VOC Impacts

   The DNR and GSP would like to inform Boeing that the monitoring wells proposed to be installed at the property line (MW 10 nest) may not be 'clean' groundwater monitoring points. If the plume appears to extend off of Boeing property it may be necessary to install a nest further southeast in order to obtain "clean" monitoring points downgradient of the contaminated area.

4. Section 3.3.1 Supplemental Soil Evaluation at Bldg. 27

   Diesel Petroleum Hydrocarbons have been detected in Borings B27I9 and Boring B27E2. Because of the high concentration of diesel in the groundwater (120 ppm at B27I9; 11 ppm at B27E2) and soil (1400 ppm at B27I9; 4500 ppm at B27E2) it will be necessary to determine the horizontal extent of the contamination. TPH testing should be included in subsequent sampling in this area. Boeing has informed the DNR that monitoring wells exist east of boring B27E2. These wells should be utilized to test for LNAPL and evaluate groundwater impacts of the diesel.

5. Section 3.2.2 Supplemental Groundwater Evaluation at Bldg. 220

   Evaluation of Diesel Petroleum Hydrocarbon Impacts

   In addition to determining possible on-site migration of the contamination, DNR and GSP recommends to drill borings in order to delineate the horizontal impact of the contamination downgradient of Boring B220N1. The DNR and GSP understands that there may be obstructions in this area (buildings, utilities, etc.) so we would ask Boeing to try to locate points downgradient as is physically possible.

6. Section 3.3.3 Soil Evaluation of Railroad Corridor

   High metals concentrations were detected at the southern portion of the site. In order to determine the southern extent of this contamination, metals should be sampled for in the RR2 and RR3 borings as well as an additional boring in between these locations. If high levels still exist at these points, additional borings across the street should be drilled to completely identify the horizontal extent of the contamination.

7. Section 4.1.1 Soil Sampling

   The work plan states that each boring will be grouted with granular bentonite to surface and hydrated. Hydration of the granular bentonite from the surface is not advisable because the bentonite at the bottom (20 feet in many borings) would be inadequately hydrated. If the granular bentonite is placed in the well it is suggested that it be hydrated on one-foot lifts. The preferred method of abandonment would be tremie grouting with bentonite grout.

8. Section 4.1.2 Groundwater Sampling

   Please indicate if pre-packed well screens will be used in the temporary piezometer installations.

In order to expedite the completion of this project it will not be necessary for Boeing to resubmit a workplan for the Phase 2 investigation. The comments outlined above were discussed in a conference call conducted on September 18, 2000 and Boeing agreed to incorporate them into the existing workplan. DNR would like Boeing to respond in writing that these comments will be addressed in the Phase 2 investigation as was discussed in the conference call. This response should be submitted to the HWP and EPA within 5 days of receipt of this letter. If you have any questions concerning this letter, please do not hesitate to contact me or Richard Nussbaum, P.E., R.G., at (573) 751-3553.

Sincerely,

HAZARDOUS WASTE PROGRAM

PM Quinn

Patrick Quinn
Environmental Engineer
Permits Section

PQ:sw

c: Mr. Jerome Johnson, U.S. EPA Region VII
DNR, St. Louis Regional Office